

William F. Adler  
Executive Director  
Federal Regulatory Relations

1275 Pennsylvania Avenue, N.W., Suite 400  
Washington, D.C. 20004  
(202) 383-6435

DOCKET FILE COPY ORIGINAL  
**PACIFIC \* TELESIS**  
Group - Washington

DOCKET FILE COPY ORIGINAL  
**RECEIVED**

**JAN 3 1994**

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

**January 3, 1994**

**William F. Caton**  
**Acting Secretary**  
**Federal Communications Commission**  
**Mail Stop 1170**  
**1919 M Street, N.W., Room 222**  
**Washington, D.C. 20554**

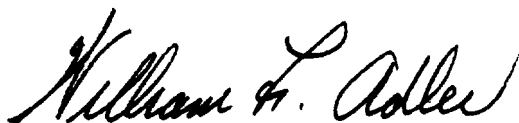
Dear Mr. Caton:

Re: *GEN. Docket No. 90-314 - Amendment of the Commission's Rules to Establish New Personal Communications Services*

On behalf of Pacific Bell and Nevada Bell, please find enclosed an original and six copies of their "*Opposition and Comments To Petitions For Reconsideration*" in the above proceeding.

Please stamp and return the provided copy to confirm your receipt. Please contact me should you have any questions or require additional information concerning this matter.

Sincerely,



Enclosures

No. of Copies rec'd  
List A B C D E

025

Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554

RECEIVED

JAN 3 1994

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

In the Matter of )

Amendment of the Commission's )  
Rules to Establish New Personal )  
Communications Services )

GEN Docket No. 90-314

RM-7140, RM-7175, RM-7618

**OPPOSITION AND COMMENTS OF PACIFIC BELL AND  
NEVADA BELL TO PETITIONS FOR RECONSIDERATION**

**JAMES P. TUTHILL  
THERESA L. CABRAL  
BETSY STOVER GRANGER**

140 New Montgomery St., Rm. 1525  
San Francisco, CA 94105  
(415) 542-7649

**JAMES L. WURTZ**

1275 Pennsylvania Avenue, N.W.  
Washington, D.C. 20004  
(202) 383-6472

**Attorneys for Pacific Bell  
and Nevada Bell**

**Date: January 3, 1994**

## TABLE OF CONTENTS

	<u>PAGE</u>
SUMMARY .....	ii
I. THE POWER LEVEL FOR BASE STATIONS SHOULD BE RAISED TO A MINIMUM OF 1900 WATTS EIRP PER RF CHANNEL .....	1
II. THE PCS-TO-FIXED MICROWAVE INTERFERENCE CALCULATION METHOD NEEDS TO BE REVISED TO TAKE INTO ACCOUNT PROPAGATION DIFFERENCES IN URBAN AND RURAL ENVIRONMENTS .....	3
III. THE COMMISSION WAS CORRECT NOT TO IMPOSE STRUCTURAL SEPARATION ON LEC PCS PARTICIPATION ..	4
IV. TELOCATOR'S PROPOSAL TO LIST COUNTIES IN THE MTAS AND BTAS IS AN ACCEPTABLE ALTERNATIVE TO THE CURRENT RULE .....	6
V. CELLULAR PROVIDERS OF PCS SHOULD NOT BE PERMITTED TO COUNT CELLULAR POP COVERAGE TOWARD PCS COVERAGE IN THE SERVICE AREA .....	8
VI. THE TEN PERCENT RULE IS CLEAR ON ITS FACE .....	9
VII. THE SPECTRUM ETIQUETTE FOR UNLICENSED SERVICES SHOULD BE REVIEWED BY AN OPEN INDUSTRY FORUM ....	10
VIII. COMMON CARRIERS SHOULD NOT BE PROHIBITED FROM PROVIDING WIRELESS CENTREX ON UNLICENSED FREQUENCIES .....	11
IX. CONCLUSION .....	13

## SUMMARY

Our position on various issues on reconsideration is the following:

1. The power level for base stations should be raised to a minimum of 1900 watts EIRP per RF channel. This is necessary if PCS is to effectively compete with cellular services.
2. The Commission should adopt the Okumura-Hata or COST231 propagation models to estimate path loss. These models will provide more realistic estimates of propagation loss.
3. Comcast does not provide any new arguments or facts to disturb the Commission's conclusion that structural separation is not necessary for LECs to provide PCS.
4. We believe that the intellectual property concerns raised by Killen and Associates are overstated. If the Commission believes it should modify the description for license areas, Telocator's proposal to list counties in the MTAs and BTAs is an acceptable alternative to using Rand McNally's MTAs and BTAs.
5. Sprint's proposal to include cellular coverage in determining whether or not the provider meets PCS build-out requirements should be rejected. Its proposal would give cellular-PCS providers an unfair advantage over others.
6. The 10% PCS eligibility rule is clear and appropriate, and US West's interpretation is wrong. The rule does not permit a cellular licensee which covers less than 10% of

the MTA population but which does cover 10% or more of a BTA within an MTA to bid for a 30 MHz MTA license as well as the 10 MHz BTA block.

7. The spectrum etiquette for unlicensed services should be reviewed by an open industry forum.
8. The Commission should clarify that common carriers may provide wireless centrex services on unlicensed frequencies. If AT&T is seeking to limit competition to its PBX products, its position should be rejected because that would restrict competition.

JAN 3 1994

Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554  
FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

In the Matter of )  
 )  
Amendment of the Commission's ) GEN Docket No. 90-314  
Rules to Establish New Personal )  
Communications Services ) RM-7140, RM-7175, RM-7618  
\_\_\_\_\_ )

**OPPOSITION AND COMMENTS OF PACIFIC BELL AND  
NEVADA BELL TO PETITIONS FOR RECONSIDERATION**

Pursuant to Section 1.429(f) of the Commission's Rules, Pacific Bell and Nevada Bell file the following comments on the Petitions for Reconsideration filed in the above-captioned proceeding with respect to the Commission's Second Report and Order on PCS.<sup>1</sup>

I. **THE POWER LEVEL FOR BASE STATIONS SHOULD BE RAISED TO A  
MINIMUM OF 1900 WATTS EIRP PER RF CHANNEL.**

There is widespread agreement in the Petitions for Reconsideration that the Commission's base station power limit of 100 watts EIRP is too low.<sup>2</sup> However, the majority of these petitioners propose a maximum power limit that is still too low.

<sup>1</sup> Amendment of the Commission's Rules to Establish Personal Communications Services, GEN Docket 90-314, Second Report and Order released October 22, 1993 ("PCS Order").

<sup>2</sup> See, e.g., Motorola, p. 7; PacTel Corporation, pp. 1-5; Telocator, pp. 1-8; Ameritech, pp. 1-2.

For example, Ameritech,<sup>3</sup> Motorola, MCI,<sup>4</sup> and Northern Telecom<sup>5</sup> support a base station power limit of 1000 watts. PacTel supports a maximum power level of no less than 1500.<sup>6</sup> Sprint<sup>7</sup> and US West<sup>8</sup> support a power limit of 1600 watts. As we indicated in our Petition, we do not believe that any specific limit on radiated power should be mandated.<sup>9</sup> However, if the Commission decides one is necessary, the base stations, at a minimum, must be allowed to operate up to 1900 watts EIRP. This power level will allow PCS to approach parity with analog cellular systems. In order to truly achieve parity with cellular providers, as we indicated in our Petition, we believe the actual power level would need to be even higher, in the range of 2400-2500 watts EIRP.<sup>10</sup> Appendix A contains a technical explanation of the correct methodology used to compare power levels operating at different frequencies.

A power limit that approaches parity with cellular systems is necessary to achieve the Commission's goals of universal service, speedy deployment, diverse services and

---

<sup>3</sup> Ameritech, pp. 1-2.

<sup>4</sup> MCI, pp. 7-8.

<sup>5</sup> Northern Telecom, p. 5.

<sup>6</sup> PacTel Corporation, pp. 1-5.

<sup>7</sup> Sprint, p. 15.

<sup>8</sup> US West, pp. 13-15.

<sup>9</sup> Pacific Bell and Nevada Bell, p. 3.

<sup>10</sup> Id. at p. 4.

competitive delivery.<sup>11</sup> A low power, such as the Commission's limit of 100 watts, will strangle the deployment and development of PCS. It will require many more cells than otherwise necessary to provide a viable service making the service more expensive. The low limit also makes the Commission's already stringent build-out requirements even more difficult to meet because it would require so many more cells in rural areas.

For PCS to compete effectively with cellular service on an economic basis the power level for base stations must approach parity with cellular service. Consequently, the lowest acceptable power level is 1900 watts.

**II. THE PCS-TO-FIXED MICROWAVE INTERFERENCE CALCULATION METHOD NEEDS TO BE REVISED TO TAKE INTO ACCOUNT PROPAGATION DIFFERENCES IN URBAN AND RURAL ENVIRONMENTS.**

The FCC has chosen the Longley-Rice propagation model to calculate interference between PCS and existing microwave users.<sup>12</sup> Several petitioners have raised concerns about this choice. As TIA points out in Appendix D, the Commission applies a correction factor to the Longley-Rice model that was drafted for use with the Okumura-Hata model.<sup>13</sup> Moreover, as Ameritech notes, the Longley-Rice model is based upon a relatively conservative assumption of free space loss to the horizon.<sup>14</sup>

---

<sup>11</sup> PCS Second Report and Order at para. 5.

<sup>12</sup> PCS Second Report and Order at para. 172.

<sup>13</sup> Fixed Point-to-Point Communication Section of the Network Equipment Division of the Telecommunications Industry Association ("TIA"), p. 11, n.25.

<sup>14</sup> Ameritech, p. 2.



For this reason, Pacific Bell and Nevada Bell propose the Okumura-Hata model which provides more realistic estimates of propagation loss in suburban and rural areas with corresponding correction factors for those respective environments. For urban environments we propose a model that is more suitable to estimate the propagation loss due to urban clutter. This is the COST231 model which shows realistic propagation loss related to urban settings, specifically those where a microcell architecture is deployed. For example, the COST231 model takes into account the street layout and the distances between buildings and numerous other factors.

We support any efforts by TIA's TR14.11 committee which proceeds in the direction of the Okumura-Hata or COST231 models to estimate path loss for PCS interference to existing microwave users.

### III. THE COMMISSION WAS CORRECT NOT TO IMPOSE STRUCTURAL SEPARATION ON LEC PCS PARTICIPATION.

Comcast is the sole petitioner advocating that the Commission should reconsider its decision not to impose a structural separation requirement on LEC provision of PCS.<sup>15</sup> It provides neither any new arguments nor any credible support for its position. It's petition merely reargues positions in the comments and reply comments.<sup>16</sup>

---

<sup>15</sup> Comcast, pp. 19-21.

<sup>16</sup> Comments of Comcast PCS Communications, Inc., November 9, 1992, pp. 12-16; Reply Comments of Comcast PCS Communications, Inc., January 8, 1993, pp. 7-10.

The Commission has had extensive experience in evaluating the value of separate subsidiaries, and it has found them to be counterproductive. Regarding enhanced services, the Commission stated: "our experience with structural separation shows that it inhibits BOC provision of enhanced services.... It imposes direct monetary costs and results in loss of efficiencies and economies of scope."<sup>17</sup> Concerning CPE, the Commission removed the structural separation requirement because it found "the net benefits of the structural separation requirement...against the net benefits of non-structural safeguards..., lead us to conclude that the structural requirements should be eliminated. We see substantial benefits to users in permitting the BOCs to respond to marketplace demands by organizing their CPE and basic services operations in the most efficient way to satisfy consumers."<sup>18</sup>

Established precedent and experience exist for concluding that the costs of structural separation outweigh the benefits. Here, the Commission found that "by seriously limiting the ability of LECs to take advantage of their potential economies of scope, such [separate subsidiary] requirements would jeopardize, if not eliminate, the public

---

<sup>17</sup> In the Matter of Computer III Remand Proceedings: Bell Operating Company Safeguards and Tier 1 Local Exchange Company Safeguards, CC Docket No. 90-623, Report and Order, 6 FCC Rcd 7571, para. 8 (1991), appeal pending sub. nom., California v. FCC, No. 92-70083 (9th Cir. filed Feb. 14, 1992).

<sup>18</sup> In the Matter of Furnishing Customer Premises Equipment by Bell Operating Telephone Companies and the Independent Companies, CC Docket No. 86-79, Report and Order, 2 FCC Rcd 1431, para. 31 (1987); Memorandum Opinion and Order on Reconsideration, 3 FCC Rcd 22 (1987).

interest benefits we seek through LEC participation in PCS."<sup>19</sup> Those benefits were described by David Reed in his paper<sup>20</sup> and our comments.<sup>21</sup> Comcast provides no new arguments or facts for altering this conclusion. All that it puts forward are generalizations about purported LEC cellular interconnection abuses<sup>22</sup> and references to the expanded interconnection proceeding.<sup>23</sup> Neither of these either challenges the Commission's rationale for declining to impose separate subsidiary requirements or refutes the effectiveness of nonstructural safeguards.

**IV. TELOCATOR'S PROPOSAL TO LIST COUNTIES IN THE MTAS AND BTAS IS AN ACCEPTABLE ALTERNATIVE TO THE CURRENT RULE.**

Killen and Associates ask the Commission to reconsider the selection of Rand McNally's Major Trading Areas ("MTAs") and Basic Trading Areas ("BTAs") as the basis for the geographic boundaries for the spectrum auctions because of intellectual property issues.<sup>24</sup> Killen appears to suggest that Rand McNally would have an intellectual property right with respect to the terms "MTA and BTA" and in the underlying facts regarding which

---

<sup>19</sup> PCS Second Report and Order, para. 126.

<sup>20</sup> David P. Reed, "Putting It All Together: The Cost Structure of Personal Communications Services," November 1992, pp. 29-32.

<sup>21</sup> Comments of Pacific Telesis Group, November 9, 1992, pp. 9-11, Attachment 1, Affidavit of Jerry A. Hausman, pp. 7-11.

<sup>22</sup> Id. at p. 20.

<sup>23</sup> Id. at pp. 20-21.

<sup>24</sup> Killen and Associates, pp. 2-3.

counties are contained in each BTA. Pacific Bell and Nevada Bell do not share this concern since copyright protection would not extend to underlying facts.<sup>25</sup> Nevertheless, Telocator suggests as an alternative to the BTAs and MTAs referred to in works published commercially by Rand McNally that the Commission specify the counties contained in each BTA and MTA.<sup>26</sup> In addition to avoiding the intellectual property concerns, this proposal has the other advantages outlined by Telocator.<sup>27</sup>

1. By setting out the service descriptions fully in the Code of Federal Regulations or separate Commission releases, the Commission would ensure that the descriptions are fully accessible at little or no cost to the public.
2. Precise definitions are consistent with the Commission's decision to create a separate MTA for Alaska and several MTAs and BTAs for several insular areas.
3. This approach addresses any concerns that the 1992 version of the Rand McNally publication, upon which the Commission bases its rules, could go out of print or the MTAs and BTAs could be modified to be inconsistent with the areas on which the Commission based its PCS decision.
4. It would be easier for the Commission to adopt similar service areas for other Commission-licensed services by

---

<sup>25</sup> Copyright protection extends only to original expression, not facts. See e.g., Feist Publications Inc. v. Rural Telephone Service Co. Inc., 111 S. Ct. 1282 (1991).

<sup>26</sup> Telocator, pp. 16-18.

<sup>27</sup> Id.

standardizing the information on which the service areas would be based.

While Pacific Bell and Nevada Bell believe that the intellectual property concerns raised by Killen and Associates are overstated, we have no objection to Telocator's proposal. As noted above, in addition to addressing the intellectual property issues, it has other advantages that make it an acceptable alternative to the current rule.

V. CELLULAR PROVIDERS OF PCS SHOULD NOT BE PERMITTED TO COUNT CELLULAR POP COVERAGE TOWARD PCS COVERAGE IN THE SERVICE AREA.

Sprint proposes that where established cellular carriers obtain PCS licenses, to the extent that PCS-like service is being offered, they should be allowed to count current cellular investment and area of coverage toward their PCS service requirements.<sup>28</sup>

Pacific Bell and Nevada Bell strongly oppose Sprint's proposal. As we indicated in our Petition, we oppose the requirement that service must be provided to 90% of the population in the service area within 10 years. This requirement is overly burdensome since many service areas have significant rural areas.<sup>29</sup> Sprint's proposal would make that requirement even more objectionable. Cellular providers of PCS would have far less of an economic burden in meeting the build-out requirement than non-cellular providers of PCS.

---

<sup>28</sup> Sprint, pp. 13-14.

<sup>29</sup> Pacific Bell and Nevada Bell, pp. 5-6.

Sprint's proposal undercuts the Commission's goal of diverse services and the competitive delivery of PCS by favoring cellular providers of PCS over all other providers of PCS. Sprint seeks an unwarranted advantage that will be very harmful to non-cellular providers of PCS since the penalty for failure to meet the build-out requirements is forfeiture of the license without any ability to regain it.<sup>30</sup> The Commission must not permit the advantage Sprint seeks.

VI. THE TEN PERCENT RULE IS CLEAR ON ITS FACE.

US West raises an issue regarding what it sees as a ambiguity in Section 99.204 of the Commission's rules which states:

Entities that have attributable ownership interest of 20 percent or more in an entity that is a licensee in the Domestic Public Cellular Radio Telecommunications Service shall not be eligible for assignment of more than one 10 MHz frequency block in any PCS service area where its cellular geographic service area (CGSA) includes 10 or more percent of the population of the PCS service area as determined by the 1990 census, i.e., 10 or more percent of the population of the respective BTA or MTA is within the CGSA.<sup>31</sup>

US West states that this rule appears to allow a cellular licensee which covers less than 10% of an MTA's population but more than 10% of a BTA population within an MTA to bid for the 30 MHz MTA block as well as the 10 MHz BTA block.<sup>32</sup>

---

<sup>30</sup> PCS Second Report and Order at para. 134.

<sup>31</sup> 47 CFR, §99.204.

<sup>32</sup> US West, pp. 28-29.

US West's interpretation is contrary to the rule on its face. The rule refers to "10 or more percent of the population of the respective BTA or MTA."<sup>33</sup> The word respective makes it clear that 10% is applied to each service area individually and the eligibility in one service area does not result in eligibility in an overlapping service area. Consequently, we see no ambiguity. However, if the Commission agrees that there is an ambiguity it should rephrase the rule to indicate that the 10% rule is applied to each service area individually.

VII. THE SPECTRUM ETIQUETTE FOR UNLICENSED SERVICES SHOULD BE REVIEWED BY AN OPEN INDUSTRY FORUM.

Motorola proposes changes to the spectrum etiquette for unlicensed PCS submitted by WINForum and adopted by the Commission with minor changes.<sup>34</sup> AT&T, which was an active participant in WINForum, offers clarification to ensure proper interpretation of the WINForum etiquette adopted by the Commission.<sup>35</sup>

A well-functioning spectrum etiquette is essential to unlicensed PCS services. These efforts to make changes in the spectrum etiquette indicate that there are still ongoing concerns about various aspects of the etiquette.

---

<sup>33</sup> 47 CFR, §99.204 (emphasis added).

<sup>34</sup> Motorola, pp. 10-16.

<sup>35</sup> AT&T, p. 5.

In its order the Commission declined to submit the WINForum etiquette to a recognized standards body for further review.<sup>36</sup> However, that would be the best possible approach to deal with the ongoing concerns such as those raised by Motorola and AT&T. WINForum did not have industry-wide participation. Referral of the etiquette to a body, such as the Joint Technical Committee, would ensure that the concerns of all interested parties could be addressed. We urge the Commission not to accept piecemeal changes but rather to allow review by an open industry committee.

**VIII. COMMON CARRIERS SHOULD NOT BE PROHIBITED FROM PROVIDING WIRELESS CENTREX ON UNLICENSED FREQUENCIES.**

AT&T urges the Commission to clarify that the unlicensed band is not available for radio common carrier services.<sup>37</sup> It is not clear if AT&T seeks to prevent provision of wireless Centrex services in the unlicensed band in order to limit competition with its PBX products. We strongly oppose any limitations on the use of unlicensed frequencies.

The Commission's order indicates that some unlicensed PCS applications include "high and low speed data links between computing devices, cordless telephones and wireless PBX."<sup>38</sup> The Commission specifically states that unlicensed applications are

---

<sup>36</sup> PCS Second Report and Order, para. 184.

<sup>37</sup> AT&T, pp. 6-11.

<sup>38</sup> PCS Second Report and Order, para. 79.



not limited to those uses.<sup>39</sup> The Commission later mentions wireless LANs as another application.<sup>40</sup>

Wireless Centrex will compete with wireless PBXs. AT&T may be seeking a competitive advantage by excluding common carriers from providing a service which competes with its wireless PBXs. There is no reason to preclude wireless Centrex in the unlicensed PCS frequencies. Precluding common carrier provision of wireless Centrex in the unlicensed frequencies would deny consumers choice and limit competition. We urge the Commission to clarify that wireless Centrex services can be provided in the unlicensed frequencies allotted to PCS.

---

<sup>39</sup> Id.

<sup>40</sup> Id. at para. 80.

IX. CONCLUSION.

For the reasons stated above, we respectfully request the Commission to adopt the positions stated herein.

Respectfully submitted,

PACIFIC BELL  
NEVADA BELL

A handwritten signature in dark ink, appearing to read "James P. Tuthill", is written over the printed name.

JAMES P. TUTHILL  
THERESA L. CABRAL  
BETSY STOVER GRANGER

140 New Montgomery St., Rm. 1525  
San Francisco, California 94105  
(415) 542-7649

JAMES L. WURTZ

1275 Pennsylvania Avenue, N.W.  
Washington, D.C. 20004  
(202) 383-6472

Their Attorneys

Date: January 3, 1994

## APPENDIX A

In comparison with analog systems in the frequency range of 800 MHz, PCS operators will encounter additional losses which are related to the propagation at the higher operating frequencies (1850-2200 MHz). This is due merely to the characteristics of radio waves at these higher frequencies.

To quantify these additional losses, the most acceptable radio frequency propagation model in the cellular industry is the Okumura-Hata model which is used for the following calculations. Based upon this model, the major component which shows the additional path losses due to the higher operating frequencies is:

$$A = 26.16 \text{ Log } (F1) - 26.16 \text{ Log } (F2) \text{ dB}$$

Where:

A is the additional path loss at the PCS higher operating frequencies.

F1 is the PCS operating frequency.

F2 is the analog cellular operating frequency.

To calculate the value of term A, 2025 MHz as the operating frequency of the PCS (F1) and 859 MHz as the operating frequency of the analog cellular system were chosen. These values are approximate mid-points for the PCS and cellular bands respectively.

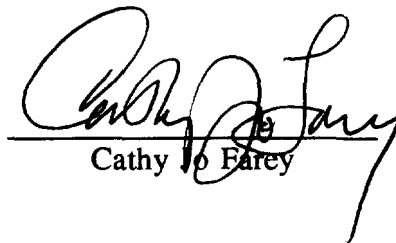
Therefore, the value of term A will be 9.74 dB. For simplicity, 9 dB is considered as the additional loss attributable to the PCS higher operating frequencies. This is a realistic path loss at these frequencies considering the presence of buildings, bridges, trees, etc.

Per the FCC's rules, the maximum power of an analog cellular system is 500W ERP (Effective Radiated Power). The equivalent of this power at PCS operating frequencies, considering the additional 9 dB loss, will be 2500 EIRP (Effective Isotropic Radiated Power.)

Thus, 500 W ERP at the operating frequency of an analog cellular system is equal to approximately 2500 W EIRP at the PCS operating frequencies considering the additional 9 dB loss.

**CERTIFICATE OF SERVICE**

I, Cathy Jo Farey, on behalf of Pacific Bell and Nevada Bell do hereby certify that I caused a copy of their foregoing "Opposition and Comments of Pacific Bell and Nevada Bell to Petitions for Reconsideration" in connection with GEN Docket No. 90-314, RM-7140, RM-7175 , RM-7618, to be served to the parties indicated on the attached Service List by United States mail, postage prepaid, on this 3rd day of January, 1994.

  
Cathy Jo Farey

SERVICE LIST  
CC DOCKET NO. 90-314

Jeffrey S. Bork  
US WEST  
1020 19th Street, N.W., Suite 700  
Washington, D.C. 20036

Stephen L. Goodman  
NORTHERN TELECOM INC.  
Halprin, Temple & Goodman  
1301 K Street, N.W.  
Suite 1020, East Tower  
Washington, D.C. 20005

John A. Prendergast  
RADIOFONE, INC.  
Blooston, Mordkofsky, Jackson & Dickens  
2120 L Street, NW, Suite 300  
Washington, D.C. 20037

Chandos A. Rypinski  
LACE, INC.  
655 Redwood Highway #340  
Mill Valley, CA 94941

Richard Rubin  
TIME WARNER TELECOMMUNICATIONS  
Fleischman and Walsh  
1400 Sixteenth Street, N.W.  
Suite 600  
Washington, D.C. 20036

Pamela J. Riley  
PACTEL CORPORATION  
2999 Oak Rd., M.S. 1050  
Walnut Creek, CA 94596

J. Barclay Jones  
AMERICAN PERSONAL COMMUNICATIONS  
Vice President, Engineering  
1025 Connecticut Avenue, N.W.  
Washington, D.C. 20036

David Cosson  
L. Marie Guillory  
NATIONAL TELEPHONE COOPERATIVE  
ASSOCIATION  
2626 Pennsylvania Avenue, N.W.  
Washington, D.C. 20037

Gail L. Polivy  
GTE SERVICE CORPORATION  
1850 M Street, N.W.  
Suite 1200  
Washington, D.C. 20036

R. Michael Senkowski  
WIRELESS INFORMATION NETWORK FORUM  
Wiley, Rein & Fielding  
1776 K Street, N.W.  
Washington, D.C. 20554

W. Scott McCollough  
TEXAS ADVISORY COMMISSION ON STATE  
EMERGENCY COMMUNICATIONS  
Asst. Texas Attorney General  
P.O. Box 12548  
300 W. 15th St. 7th Floor  
Austin, Texas 78701

Thomas A. Stroup  
TELOCATOR  
1019 19th Street  
Suite 1100  
Washington, D.C. 20036

Michael Killen  
KILLEN & ASSOCIATES, INC  
President  
382 Fulton Street  
Palo Alto, CA 94301

James H. Barker  
BELL ATLANTIC PERSONAL COMMUNICATIONS,  
INC.  
Latham & Watkins  
Suite 1300  
1001 Pennsylvania Ave., N.W.  
Washington, D.C. 20004-2505

William B. Barfield  
Charles P Featherstun  
BELLSOUTH CORPORATION  
BELLSOUTH TELECOMMUNICATIONS, INC.  
BELLSOUTH CELLULAR CORP.  
1133 21st Street, N.W., Suite 900  
Washington, D.C. 20036

Michael F. Altschul  
CELLULAR TELECOMMUNICATIONS INDUSTRY  
ASSOCIATION  
Vice President, General Counsel  
Two Lafayette Centre, Third Floor  
1133 21st Street, N.W.  
Washington, D.C. 20036

Edward R. Wholl  
NYNEX CORPORATION  
120 Bloomingdale Road  
White Plains, NY 10605

Scott K. Morris  
MCCAW CELLULAR COMMUNICATIONS, INC.  
Vice President-Law  
5400 Carillon Point  
Kirkland, Washington 98033

Stephen G. Kraskin  
U.S. INTELCO NETWORKS, INC.  
Kraskin & Associates  
2120 L Street, N.W.  
Suite 810  
Washington, D.C. 20037

David A. LaFuria  
COLUMBIA CELLULAR CORPORATION  
Lukas, McGowan, Nace & Guitierrez,  
Chartered  
1819 H Street, N.W.  
Seventh Floor  
Washington, D.C. 20006

E. Ashton Johnston  
PERSONAL NETWORK SERVICES CORP.  
Bryan Cave  
700 Thirteenth Street, N.W.  
Suite 700  
Washington, D.C. 20005-3960

Caressa D. Bennet  
RURAL CELLULAR ASSOCIATION  
Kraskin & Associates  
2120 L Street, N.W.  
Suite 810  
Washington, D.C. 20037

Michael D. Kennedy  
MOTOROLA, INC.  
Director, Regulatory Relations  
1350 I Street, N.W. Suite 400  
Washington, D.C. 20005

Nancy J. Thompson  
COMSAT MOBILE COMMUNICATIONS  
22300 Comsat Drive  
Clarksburg, MD 20871

George Y. Wheeler  
TELEPHONE & DATA SYSTEMS, INC.  
Koteen & Naftalin  
1150 Connecticut Avenue, N.W.  
Suite 1000  
Washington, D.C. 20036

Jeffrey L. Sheldon  
UTILITIES TELECOMMUNICATIONS COUNCIL  
General Counsel  
1140 Connecticut Ave., N.W.  
Suite 1140  
Washington, D.C. 20036

Kathy L. Shobert  
GENERAL COMMUNICATION, INC.  
Director, Federal Regulatory Affairs  
888 16th St., NW, Suite 600  
Washington, D.C. 20006

James F. Lovette  
APPLE COMPUTER, INC.  
One Infinite Loop, MS: 301-4J  
Cupertino, California 95014

Wayne V. Black  
Christine M. Gill  
Rick D. Rhodes  
THE AMERICAN PETROLEUM INSTITUTE  
Keller and Heckman  
1001 G Street  
Suite 500 West  
Washington, D.C. 20001

Larry A. Blosser  
MCI TELECOMMUNICATIONS CORPORATION  
1801 Pennsylvania Avenue, N.W.  
Washington, D.C. 20006

Paula J. Fulks  
SOUTHWESTERN BELL CORPORATION  
175 E. Houston, R. 1218  
San Antonio, TX 78205

James U. Troup  
IOWA NETWORK SERVICES, INC.  
Arter & Hadden  
1801 K Street, N.W.  
Washington, D.C. 20006

John W. Hunter  
PMN, INC.  
McNair & Sanford, P.A.  
1155 Fifteenth Street, N.W.  
Washington, D.C. 20005

David C. Jatlow  
THE ERICSSON CORPORATION  
Young & Jatlow  
Suite 600  
2300 N Street, N.W.  
Washington, D.C. 20037

Margaret M. Charles  
SPECTRALINK CORPORATION  
Swidler & Berlin, Chartered  
3000 K Street, N.W. Suite 300  
Washington, D.C. 20007

Larry S. Solomon  
METRICOM, INC.  
Ginsburg, Feldman & Bress Chartered  
1250 Connecticut Avenue, NW  
Washington, D.C. 20036

Ronald L. Plessner  
PCS ACTION, INC.  
Piper & Marbury  
1200 Nineteenth Street, N.W.  
Seventh Floor  
Washington, D.C. 20036

Linda C. Sadler  
ROCKWELL INTERNATIONAL CORPORATION  
Manager, Governmental Affairs  
1745 Jefferson Davis Highway  
Arlington, VA 22202

Lisa M Zaina  
Matthew Dosch  
OPASTCO  
21 Dupont Circle, NW  
Suite 700  
Washington, D.C. 20036

Carl W. Northrop  
GEORGE E. MURRAY  
Bryan Cave  
Suite 700  
700 13th Street, N.W.  
Washington, D.C. 20005

David L. Nace  
PACIFIC TELECOM CELLULAR, INC.  
Lukas, McGowan, Nace & Gutierrez,  
Chartered  
1819 H Street, N.W.  
Seventh Floor  
Washington, D.C. 20006

Robert J. Butler  
UTAM, INC.  
Wiley, Rein & Fielding  
1776 K Street, N.W.  
Washington, D.C. 20036

Glen S. Richards  
AMSC SUBSIDIARY CORPORATION  
Fisher, Wayland, Cooper & Leader  
1255 23rd Street, N.W.  
Suite 800  
Washington, D.C. 20037

John Hearne  
POINT COMMUNICATIONS COMPANY  
Chairman  
100 Wilshire Boulevard, Suite 1000  
Santa Monica, California 90401

James R. Rand  
ASSOCIATION OF PUBLIC-SAFETY  
COMMUNICATIONS OFFICIALS-INTERNATIONAL,  
INC.  
Executive Director  
Wilkes, Artis, Hedrick & Lane, Chartered  
1666 K Street, N.W.  
Washington, D.C. 20006

Paul R. Schwedler  
NATIONAL COMMUNICATIONS SYSTEM  
Assistant Chief Regulatory Counsel  
Telecommunications (DOD)  
Code AR  
Defense Information Systems Agency  
701 S. Courthouse Road  
Arlington, Virginia 22204

Barry R. Rubens  
THE CONCORD TELEPHONE COMPANY  
Manager-Regulatory Affairs  
68 Cabarrus Avenue, East  
Post Office Box 227  
Concord, North Carolina 28026-0227

Frank Michael Panek  
AMERITECH  
Attorney for Ameritech  
2000 West Ameritech Center Dr.  
Hoffman Estates, Illinois 60196

Jay C. Keithley  
SPRINT CORPORATION  
1850 M Street, N.W.  
Suite 1100  
Washington, D.C. 20036

Susan R. Athari  
PEGASUS COMMUNICATIONS, L.P.  
Baraff, Koerner, Olender & Hochberg  
5335 Wisconsin Avenue, N.W.  
Suite 300  
Washington, D.C. 20015

Stephen D. Baruch  
TRW INC.  
Leventhal, Senter & Lerman  
2000 K Street, N.W.  
Suite 600  
Washington, D.C. 20006

R. E. Sigmon  
CINCINNATI BELL TELEPHONE CO.  
Vice President-Regulatory Affairs  
201 East Fourth Street  
Cincinnati, OH 45201

Robert J. Miller  
ALCATEL NETWORK SYSTEMS, INC.  
Gardere & Wynne, L.L.P.  
1601 Elm Street, Suite 3000  
Dallas, Texas 75201

Eric Schimmel  
TELECOMMUNICATIONS INDUSTRY ASSOCIATION  
Vice President  
2001 Pennsylvania Avenue, N.W.  
Suite 800  
Washington, D.C. 20006

David E. Weisman  
Alan S. Tilles  
ASSOCIATION FOR PRIVATE CARRIER PAGING  
Meyer, Faller, Weisman, and Rosenberg,  
P.C.  
4400 Jenifer Street, N.W.  
Suite 380  
Washington, D.C. 20015

Harold K. McCombs, Jr.  
DUNCAN, WEINBERG, MILLER & PEMBROKE,  
P.C.  
1615 M Street, N.W.  
Suite 800  
Washington, D.C. 20036

Audrey P. Rasmussen  
FLORIDA CELLULAR RSA LIMITED PARTNERSHIP  
O'Connor & Hannan  
1919 Pennsylvania Avenue, N.W.  
Suite 800  
Washington, D.C. 20006-3483



Francine J. Berry  
AMERICAN TELEPHONE AND TELEGRAPH COMPANY  
Room 3244J1  
295 North Maple Avenue  
Basking Ridge, New Jersey 07920

Laura H. Phillips  
COMCAST CORPORATION  
Dow, Lohnes & Albertson  
1255 23rd Street, N.W.  
Washington, D.C. 20037

Robert M. Jackson  
BLOOSTON, MORDKOFKY, JACKSON & DICKENS  
2120 L Street, N.W.  
Suite 300  
Washington, D.C. 20037

David L. Nace  
ALLIANCE OF RURAL AREA TELEPHONE AND  
CELLULAR SERVICE PROVIDERS  
Lukas, McGowan, Nace & Gutierrez,  
Chartered  
1819 H Street, N.W.  
Seventh Floor  
Washington, D.C. 20006